Tenth
Annual Report
1983-1984

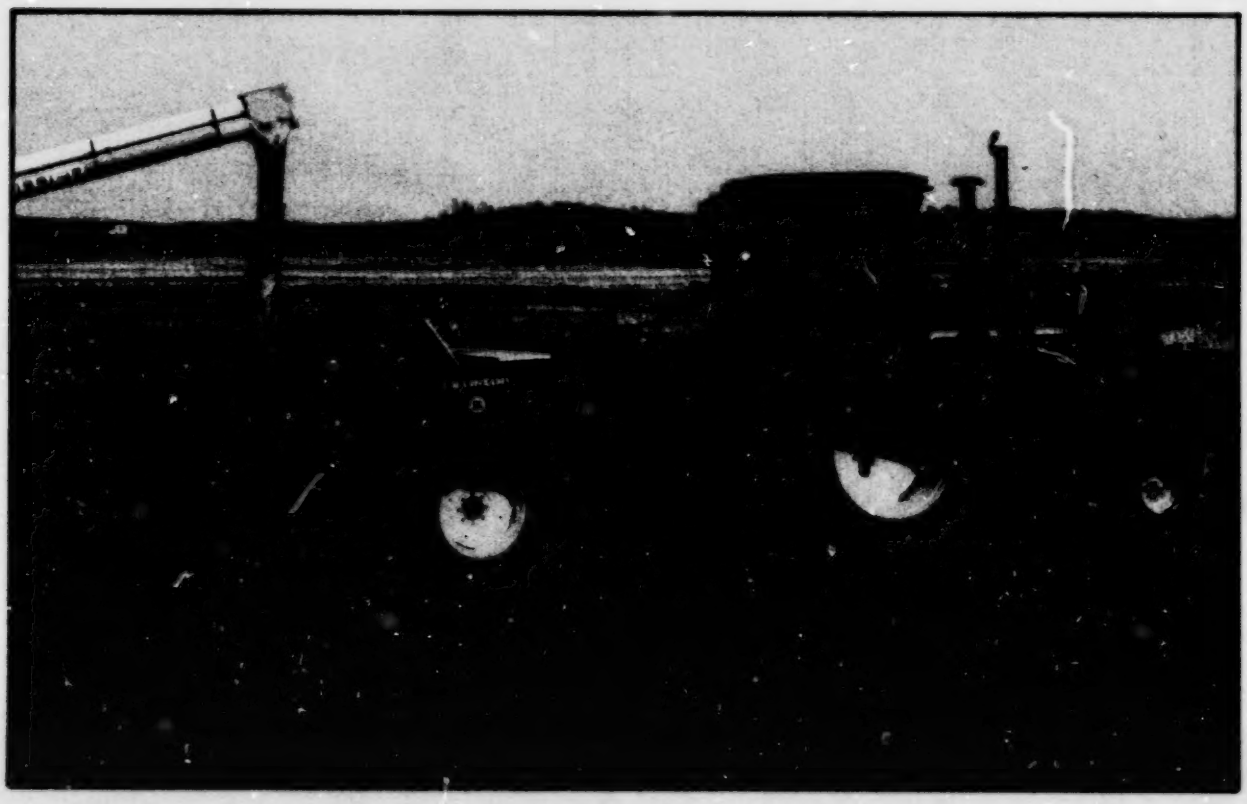
PRAIRIE AGRICULTURAL
MACHINERY INSTITUTE

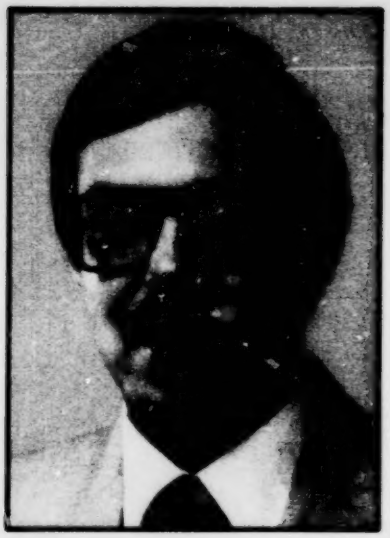
85-1415/

THE PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

"to improve the design and aid in the selection and use of agricultural machinery in the prairie provinces"

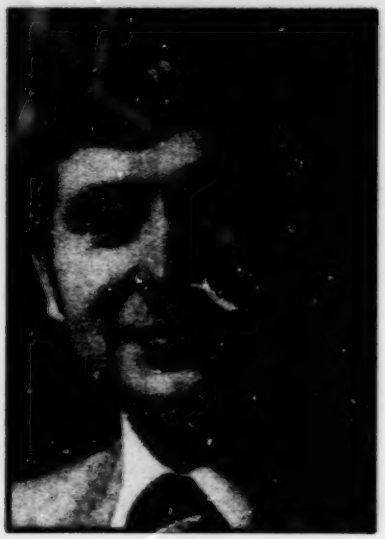
To achieve this goal, the provinces of Alberta, Manitoba and Saskatchewan established the Prairie Agricultural Machinery Institute as a unique resource to the farmers and agricultural machinery manufacturers of the prairies. Since its inception October 10, 1974, programs to provide for the evaluation and development of agricultural machines, for research into matters concerning agricultural machines and for the extension of information on agricultural machines have been the primary concern of the Machinery Institute.





Honourable
Lorne Hepworth
Minister of Agriculture
Province of Saskatchewan

Honourable
LeRoy Fjordbotten
Minister of Agriculture
Province of Alberta



Honourable
Bill Uruski
Minister of Agriculture
Province of Manitoba

MEMBERS OF COUNCIL

Name

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G. Nystuen
Spalding, Saskatchewan

COUNCILLORS
G. Blanchard
Bow Island, Alberta

J. Enns
Oak Bluff, Manitoba

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Alberta Agriculture
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A. Burghardt
Versatile Noble Cultivators Co.
Nobleford, Alberta

L. Masur
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Watrous, Saskatchewan

SECRETARY
L. G. Smith, Director
Prairie Agricultural Machinery Institute
Humboldt, Saskatchewan

LETTER OF TRANSMITTAL

Regina, Saskatchewan
March 1984

His Honour F. W. Johnson, Q.C.
Lieutenant Governor
Province of Saskatchewan

May It Please Your Honour:

Pursuant to Section 19(1) and (2) of the Prairie Agricultural Machinery Institute Act, R.S.S. 1978. I respectfully submit, for your consideration, the Annual Report of the Prairie Agricultural Machinery Institute for the fiscal year ending March 31, 1984.

Your obedient servant,

Lorne H. Hepworth
Minister of Agriculture
Province of Saskatchewan

LETTER OF TRANSMITTAL

Humboldt, Saskatchewan
March 1984

Honourable Lorne Hepworth
Minister of Agriculture
Province of Saskatchewan

Honourable LeRoy Fjordbotten
Minister of Agriculture
Province of Alberta

Honourable Bill Uruski
Minister of Agriculture
Province of Manitoba

Sirs:

It is my honour to present the Annual Report and audited financial statements of the Prairie Agricultural Machinery Institute for the fiscal year ending March 31, 1984.

Respectfully submitted,

G. Nystuen, Chairman
Prairie Agricultural
Machinery Institute Council

Humboldt, Saskatchewan
March, 1984

Mr. G. Nystuen, Chairman
Prairie Agricultural Machinery
Institute Council
Spalding, Sask.

Dear Sir:

It is my honour to submit the Tenth Annual Report of the Prairie Agricultural Machinery Institute for the year ending March 31, 1984.

Since our inception 10 years ago the Institute has gained not only prairie but national and international recognition by farmers, manufacturers, researchers and academics. We have published 365 evaluation reports on a wide variety of farm equipment, performed 195 fee-for-service contracts for manufacturers and conducted numerous research projects. With the exception of confidential projects, the information obtained has been widely disseminated through subscriptions, press releases, farm shows, radio, television and other publications.

The original objective of the Institute; "to improve the design and aid in the selection and use of agricultural machinery in the prairie provinces" is as valid today as it was ten years ago. As space age technology moves onto the farm, it becomes more important for us to provide assistance to the farmers and manufacturers.

Through the knowledge and experience we have gained in the past 10 years, we believe we can provide greater service to the farmer in the future by increasing our assistance to manufacturers in developing a better product before it is marketed.

We would like to express our appreciation to farmers, farm machinery manufacturers, council members, universities, federal and provincial departments of agriculture and to the staff of the Institute for their dedication and support over the past 10 years. We look forward to continued service in the next 10 years.

Respectfully submitted,

L G Smith

Lorne G. Smith
Director

PROGRAMS AND OBJECTIVES

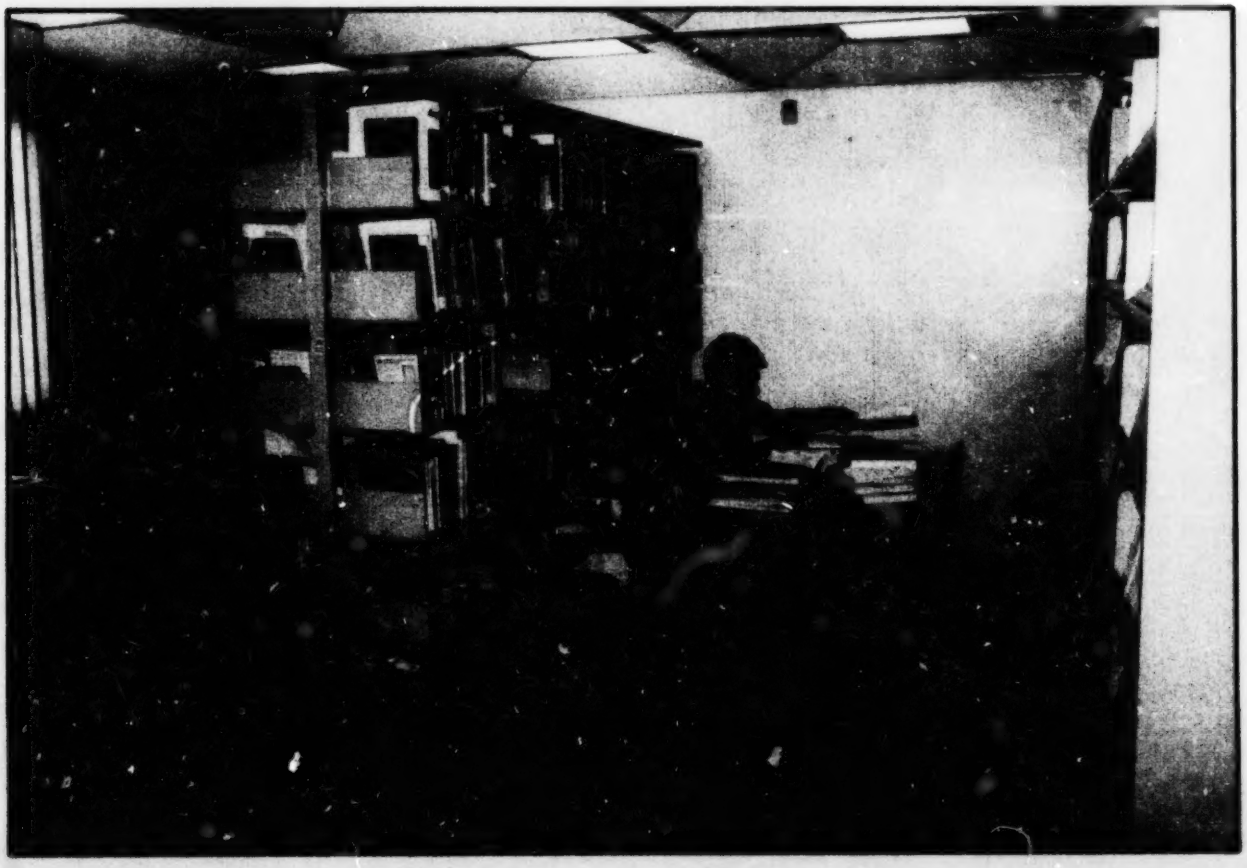
The general terms of reference for the Institute are provided in The Prairie Agricultural Machinery Institute Act which was passed by the Saskatchewan Legislature in 1974. Under this act, an agreement between the Ministers of Agriculture for Saskatchewan, Alberta and Manitoba provides for the Institute to be supported and operated as a co-operative venture of these provinces. The Prairie Agricultural Machinery Institute Council has the power to define programs and guide the activities of the Institute, within the terms of the act.

The purpose of the Institute is "to improve the design and aid in the selection and use of agricultural machinery in the prairie provinces." Three stations are located at Humboldt, Saskatchewan; Lethbridge, Alberta; and Portage la Prairie, Manitoba. Each carries out programs of special interest to farmers and manufacturers in its province.

PROGRAMS

Four distinct programs are defined and carried out by the Institute, as follows:

1. Development Program — aimed at assisting industry in developing and improving machines for prairie agriculture.
2. Evaluation Program — aimed at evaluating the performance of agricultural machinery in prairie conditions.
3. Research Program — aimed at ensuring that priority research projects, relative to agricultural machinery, are carried out to suit changing agricultural practices and economic conditions.
4. Extension Program — aimed at providing farmers with information to assist in the intelligent purchase, and safe and efficient operation of agricultural machinery.



DEVELOPMENT PROGRAM

Under this program, assistance is provided to manufacturers in developing and improving machines to suit prairie needs. This may take the form of prototype or preproduction testing, design modification, or assistance in developing new machine concepts.

Some of the services available to manufacturers include the use of mobile field laboratories and specialized measuring equipment, durability testing of components or complete machine assemblies, experimental stress analysis, design of electronic control systems, standards compliance testing, sound level measurement, high speed photography, technical information searches and finite element analysis.

Every effort is made to assist prairie manufacturers who request immediate help to remedy urgent problems. Fee for service arrangements for development work are negotiated between the manufacturer and the Institute. A confidential report is provided to the manufacturer at the conclusion of each project.

EVALUATION PROGRAM

The Institute carries out functional evaluation of agricultural machines to determine performance characteristics, workrates, power requirements, safety aspects and general suitability for prairie agriculture.

Priorities for selection of test machines are based on the availability of performance data, the uniqueness of the machine for prairie agriculture and the frequency of information requests.

Field work is performed in selected locations throughout the prairie provinces. Results of evaluation work carried out by the Institute are made available to the public.

RESEARCH PROGRAM

The Institute conducts selected timely research projects on machinery related subjects, usually in co-operation with universities, research institutions, test agencies and interested manufacturers. These projects are aimed at determining design parameters, assessing new machinery for modifying cultural practices, developing

mechanization to suit new crops, developing evaluation procedures and developing safety and performance standards.

EXTENSION PROGRAM

Extension involves the dissemination of information obtained through other programs, to farmers, manufacturers, extension agencies and other interested groups and individuals.

The main extension vehicles are evaluation reports and "Gleanings" published and distributed to the public by the Institute. "Machinery Institute News" is circulated to extension agencies and others, to keep them informed on PAMI activities. Staff are also involved in short courses, meetings, tours, radio and television interviews, news releases, trade fairs and have membership on many external committees.

The extension program also involves preparation of movie and slide presentations on programs and individual projects for use by Institute and other extension agency personnel. Exhibits are also prepared for use at various functions.

Selected extension projects, involving assembly and publication of information from various sources, are carried out as indicated by extension activities and information requests.

PROGRESS DURING 1983-84

ACTIVITIES AT HUMBOLDT STATION

— G.E. FREHLICH, STATION MANAGER

EVALUATION PROGRAM

Reports on 13 machines tested were completed by March 31, 1984. These included reports on two grain combines, two grain dryers, one large self-propelled windrower, one double windrower attachment, one intermediate cultivator, one rolling harrow, one depth controller, one crop divider, two heat exchangers and one combine harvest measuring system. All the reports were mailed out before the season of use.

The back cover of all evaluation reports now contains a rating chart. This chart summarizes the performance of the machine and provides the farmer with a quick and easy method of comparing different machines. The rating chart has been very well accepted by our subscribers.

DEVELOPMENT PROGRAM

The Humboldt Station worked on 21 development projects for 18 different manufacturers. Seventeen of these projects were completed by March 31, 1984, for a total revenue of $71,000.00.

The development projects have included performance testing of a prototype heat exchanger, calibration of a seed metering system for a newly developed applicator box, redesign of a batch grain dryer that increased drying capacity by 250%, modification and field testing of a double windrow attachment, durability testing of a prototype cultivator trip mechanism, development of a unique seed distribution and metering system for cultivators, testing of a prototype natural air distribution system for hopper bins, and measurement of grain drill accelerations for designing a grain drill transport system. Although these projects and the others undertaken over the year were small, they were very worthwhile to the manufacturer.

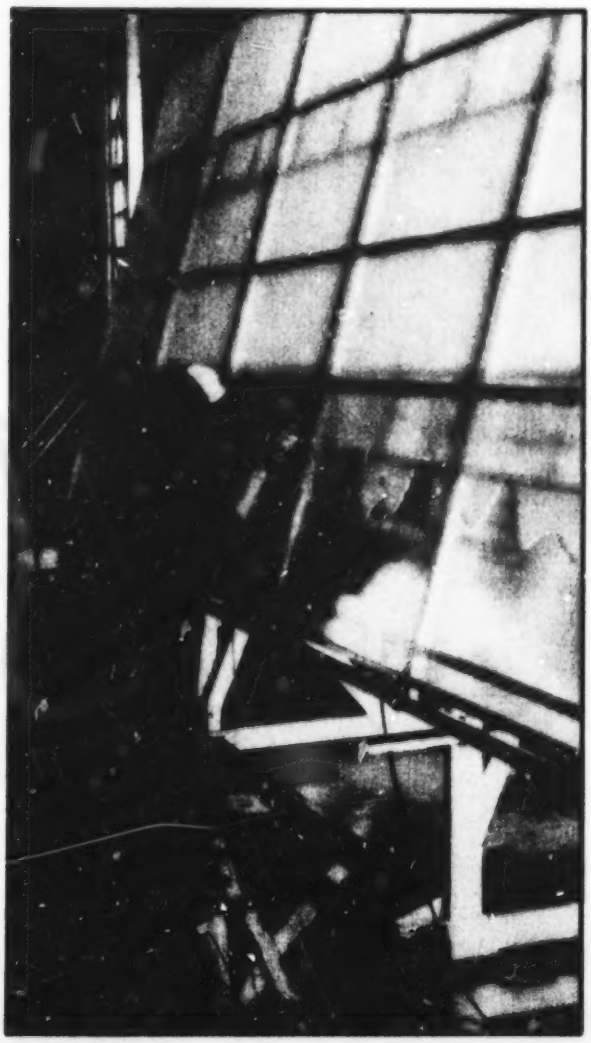
Special facilities and test equipment are needed to carry out this specialized development, evaluation, and research work. During the year the Humboldt station designed and constructed heat exchanger test apparatus and a durability tester for cultivator shank trip mechanisms.

The heat exchanger test apparatus is capable of maintaining the desired temperature, humidity, and flow of the exhaust and supply air entering the heat exchanger. It is also instrumented to accurately measure supply and exhaust inlet and outlet conditions. Heat exchanger tests can be performed under controlled conditions for flows up to 800 cfm (378 L/s) and temperatures down to −31° F (−35° C).

The durability tester for cultivator shank trip mechanisms, is capable of simulating the tripping of cultivator shank mechanisms over obstacles in the field at speeds up to 7 mph (11.2 km/h). The tester can be used to determine the durability of the shank trip mechanism and to measure the forces encountered by trip mechanism components while tripping.

EXTENSION PROGRAM

Extension continued to be high priority at the Institute. Staff at the Humboldt Station have transferred information to or been in contact with over 8,000 people. The highlight of the extension activities over the year was 12 air seeder clinics, and grain combine and dryer clinics held throughout the province. Over 1,300 farmers attended these clinics. In addition to the clinics, a presentation on heat exchangers was made to over 175 farmers at the Brandon Hog Days, and a combine presentation was made to 85 local Brandon farmers. Displays were set up at the Mexabition in Saskatoon, and the Agribition and Western Canada Farm Program Show in Regina. The Institute was represented at several other smaller shows throughout the province.



Fourteen newspaper articles were completed, along with one Gleanings. Six TV interviews and 10 radio interviews were conducted. In addition, PAMI staff were filmed for television while testing combines in the field. This film was featured on a one-half hour program on several television stations throughout Western Canada in early 1984.

Displays were built and promotional material prepared. A combine loss calculator which quickly and easily determines the loss behind a combine has been printed and made available to the farmers.

During 1983-84, over 400 people were toured through the station at Humboldt. The tour groups have included dignitaries, farmers and scientists from the United States, Norway, Australia, the United Kingdom, Germany, South Africa and China. Many of the Ministers of the Saskatchewan government have also toured the Institute as well as 25 employees of the Federal Industry Trade and Commerce group.

Technical papers on heat exchanger and grain dryer testing were presented at the ASAE Winter Meeting in Chicago. These technical meetings provide an excellent opportunity to meet and talk to other engineers working on related projects. In addition to these technical meetings, the Institute is well represented on several provincial and Western Canadian committees concerned with farm machinery.

RESEARCH PROGRAM

Several research projects were initiated and completed. These included tests to determine: the affect of grain moisture content, grain variety, frost, and rewetting the grain, on drying rates and grain quality; a procedure for accurately measuring combine losses in the field using a catch pan; the benefits that can be obtained from combination drying of grain; and the increase in combine efficiency that can be obtained by reducing the amount of straw passing through the combine when harvesting wheat and barley.

In addition to the above research projects, several applications have been sent to Agriculture Canada to obtain funding under their AERD and ERDAF programs for continued research in our areas of expertise.

ACTIVITIES AT LETHBRIDGE STATION

— E.H. WIENS, STATION MANAGER

EVALUATION PROGRAM

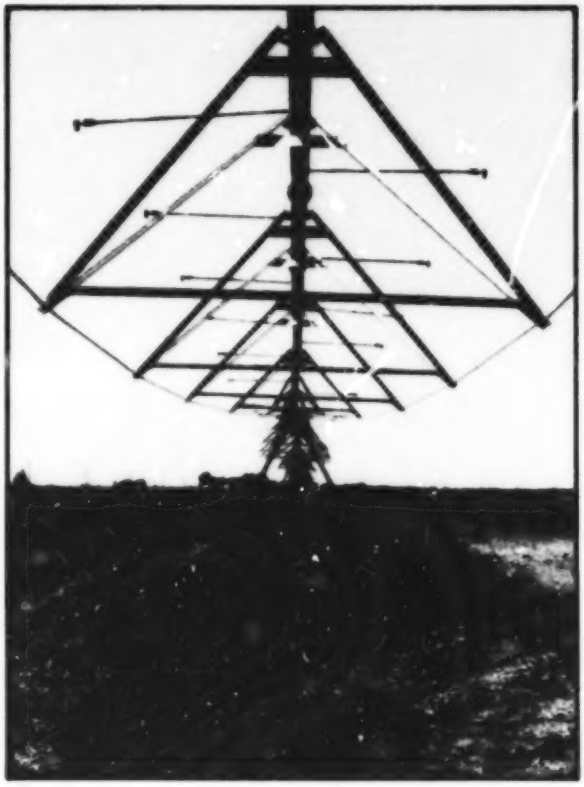
Evaluations were completed and reports were prepared on five livestock building ventilation fans, one automatic tillage depth controller, two automatic rate controllers for sprayers, one field sprayer, two granular herbicide applicators, four irrigation and drainage pumps, one linear move irrigation system and five grain aeration fans. Work continued for a second year on the evaluation of spinning disc rotary nozzles. Field and laboratory work was completed and the report was in preparation for a series of seven fertilizer banding knives. Also in the program was evaluation of an air seeder and a centre pivot irrigation system. Work was initiated on further evaluation of livestock building ventilation and grain aeration fans, automatic tillage depth controllers and field sprayers. Other new projects initiated included evaluation of pneumatic grain conveyors and a device to inject chemical into a sprayer's plumbing system at the pump, eliminating the need for in-tank mixing.

DEVELOPMENT PROGRAM

Six confidential development projects were completed for farm machinery manufacturers and other clients. These include three projects using the fan testing facility, located at Lethbridge, to develop and improve fans and fan performance for three clients. One project involved assistance in improving performance of a grain moisture meter. Two projects were related to obtaining information for the improvement in the design of drill openers for use in minimum tillage seeding. All projects were performed for prairie province based clients.

EXTENSION PROGRAM

The highlight of the year in the extension area at the Lethbridge station was the "Open House" held on October 25 and 26. This provided the farming public the opportunity to view the testing facility, get a better idea of how machinery is tested and provided an opportunity on a firsthand basis to discuss test results with the project engineers. The open house was a success, with about 1000 people attending.



Additional extension activities within Alberta included attending in excess of 50 farmers meetings involving approximately 3000 farmers. In addition, approximately 200,000 more people were exposed to PAMI through manned displays at two weed fairs, three farm machinery shows, a plowing match and commodity group conventions.

Seven press releases were prepared and media exposure consisted of 29 radio interviews, 11 television interviews, in addition to about 15 special newspaper and magazine articles based on individual interviews. One technical paper was presented at an agricultural conference.

During the course of the year, most of the district agriculturists within Alberta were visited, resulting in close cooperation and working together in preparing farmer attended extension meetings.

Throughout the year, slide and movie filming of machinery testing was continued to prepare presentations for use by district agriculturists. An excellent 16 mm movie presentation dealing with the advantages and disadvantages of air seeders was completed and distributed to the agricultural

extension departments in the three prairie provinces.

In addition to local farmer tours of the Lethbridge facilities, the international recognition the Institute has gained was brought to the fore by visitations by technical individuals from Scotland, Germany and the United States. The close relationship between PAMI and Alberta educational institutions was evidenced by staff, and student tours from the Lethbridge Community College, Olds Agricultural College and Lakeland College, Vermilion, Alberta. In total, in excess of 100 people toured the Lethbridge Station over the course of the year.

RESEARCH PROGRAM

Several research projects were either completed, in progress or initiated. One project was cooperative undertaking with the Agriculture Canada Research Station at Lethbridge, to determine the effect on power requirements, when using various tillage implements, due to the top application of different rates of manure, over a number of years. Another cooperative project with the Agriculture Canada Research Station involved measuring the droplet size spectra for a variety of herbicide application techniques and devices, as well as developing procedures and techniques for measuring droplet sizes and developing computer programming for data analysis. This project also involved the cooperation of the Canada Defence Research Station at Suffield, Alberta. Another cooperative undertaking was involvement in development of "Livestock Building Fan Testing Standards" for the Canada Standards Association (CSA). A further project was initiated in cooperation with Alberta Agriculture to study the effect on weed control of applying herbicides at reduced water and chemical rates.

An in-house project which was initiated and ongoing is the investigation of a grain damage meter. This device has been shown to be useful in determining kernel damage to corn. The investigation is to determine if it is useable in cereal and oilseed crops.

ACTIVITIES AT PORTAGE STATION

— G.M. OMICHINSKI, STATION MANAGER

EVALUATION PROGRAM

Evaluation programs were completed for 16 machines covering a wide spectrum of farming practices: four livestock water medicators; four grain augers; two forage harvesters; two forage blo-decks; two row crop cultivators; two drill fills. At year end, evaluation reports were in preparation for four row crop planters and five PTO standby alternators. Evaluation projects initiated were: three grain augers; two grain cleaners; one auger safety device; two no-till drills. The evaluation procedure for grain augers was modified to cover the performance characteristics in damp grain. The venture into the evaluation of no-till drills was the result of increasing production of winter wheat (stubble sown), and increased interest expressed by zero tillage and reduced tillage associations.

DEVELOPMENT PROGRAM

The expansion of development work carried out by the Portage station received a high priority. A total of $27,695 was billed for services concerning development activities. Projects carried out under the sponsorship of manufacturers included a grain auger, a straw chopper, and two tractor roll over protective structures. A subcontract for supervisor services of a whole crop harvesting experiment was obtained and carried out. An Agriculture Canada AERD contract concerning a grain screener device was approved and work initiated. A second AERD contract concerning the functional and agronomic evaluation of three types of no-till drills was prepared and submitted for approval. This will supplement the evaluation activity initiated in this area.

Efforts were undertaken to install previously acquired equipment for the provision of a vibration testing service. This facility will provide manufacturers the unique opportunity to simulate field conditions on prototype machines. It will also be of assistance in carrying out evaluation projects. Limited building space and budgets will restrict operating capacity of the equipment.

The Portage station continued its involvement with tractor testing under the OECD test code, developing its expertise in this area with visits to OECD the test station of NIAE, England and by participating in the annual OECD conference on tractor testing.

EXTENSION PROGRAM

The Farm Progress Show, fairs and exhibitions were attended with the display trailer. Efforts to increase the number of subscribers in Manitoba were not significantly successful. As a result, a display poster campaign was initiated with the intention of distribution to key farmer meeting points i.e. elevators, agriculture offices, etc.

In support of Manitoba manufacturers of farm equipment, an agri-component show in Kansas City, and an export development tour of Australia were attended. Both of these activities received financial support from programs sponsored by the Manitoba government.

An updated Research and Development Brochure was prepared and printed for the promotion of development work. A sprayer patternator display was built to demonstrate effects of sprayer pressure and nozzle height/wear on spray distribution. A number of tours of the station were hosted and presentations on the Institute's work were made at the invitation of farm and manufacturer's associations.

RESEARCH PROGRAM

A quasi-research project concerning a survey of tractor reliability/durability was initiated. A pilot survey was prepared and distributed to fifty owner/operators of two tractors in the 100-150 HP class. A response rate of greater than 50% was received. The results indicated that information concerning the performance of farm machinery can be effectively obtained in this manner. A more extensive survey with an altered format is planned for the future.

AUDITOR'S REPORT

To the Members of the Legislative Assembly
Province of Saskatchewan

I have examined the statement of financial position of the Prairie Agricultural Machinery Institute as at March 31, 1984 and the statement of revenue and expenditure and fund balance for the year then ended. My examination was made in accordance with generally accepted auditing standards, and accordingly included such tests and other procedures as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the financial position of the Prairie Agricultural Machinery Institute as at March 31, 1984 and the results of its operations for the year then ended in accordance with accounting principles described in Note 1 to the financial statements applied on a basis consistent with that of the preceding year.

W. C. Lutz, F.C.A.,
Provincial Auditor.

Regina, Saskatchewan
June 28, 1984.

PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

Statement 1

STATEMENT OF FINANCIAL POSITION

March 31, 1984
(with comparative figures at March 31, 1983)

ASSETS	1984	1983
Current		
Bank	$ 160,359	$ 131,023
Short term investments, at cost	747,214	618,421
Accounts receivable	107,512	101,221
Travel advances	4,760	4,700
Prepaid expenses	20,533	26,770
	1,040,378	882,135
Fixed: at cost		
Assets under capital leases (Note 4)	189,049	189,049
Buildings	2,659,377	2,649,205
Equipment — for evaluation	90,075	115,727
Equipment	1,614,191	1,503,384
Land and improvements	361,457	361,203
Furniture	280,658	275,562
Vehicles	234,946	225,311
Reference material	12,970	12,970
	5,442,723	5,332,411
	$6,483,101	$6,214,546

LIABILITIES AND FUND BALANCE	1984	1983
Current Liabilities:		
Accounts payable	$ 108,944	$ 79,687
Unearned subscription income	59,957	45,466
Obligations under capital lease	30,504	26,013
	199,405	151,166
Non-Current Liabilities:		
Unearned subscription revenue	118,263	110,245
Less current portion	59,957	45,466
	58,306	64,779
Obligations under capital lease (Note 3)	153,387	179,400
Less current portion	30,504	26,013
	122,883	153,387
Fund Balance:		
Fixed assets (Note 4)	5,289,336	5,153,011
Operating (Statement 2)	813,171	692,203
	6,102,507	5,845,214
	$6,483,101	$6,214,546

(See accompanying notes to the financial statements)

STATEMENT OF REVENUE AND EXPENDITURE AND FUND BALANCE

Statement 2

Year Ended March 31, 1984
(with comparative figures for the 1983 year)

	1984	1983
Revenue: (Note 1)		
Provincial grants		
— Saskatchewan	$1,181,250	$1,181,250
— Alberta	918,750	918,750
— Manitoba	525,000	525,000
	2,625,000	2,625,000
Fees for service	114,871	152,451
Investment income	101,842	147,794
Other income	13,063	19,160
Sale of fixed assets	24,879	28,035
Subscription income	73,831	82,850
Total revenue	2,953,486	3,055,290
Expenditure (Schedule 1)	2,832,518	3,210,687
Excess of revenue over expenditure (expenditure over revenue)	120,968	(155,397)
Fund balance, beginning of year	692,203	847,600
Fund balance, end of year	$ 813,171	$ 692,203

(See accompanying notes to the financial statements)

NOTES TO FINANCIAL STATEMENTS

March 31, 1984

1. Significant Accounting Policies

Fixed Assets

Since the acquisition of fixed assets is financed primarily through grants received from the Provinces of Manitoba, Saskatchewan and Alberta, transactions affecting fixed assets are accounted for on a fund accounting basis. That is, in the Statement of Revenue and Expenditure and Fund Balance (Statement 2), all grants are recorded as revenue and the purchase of fixed assets are recorded as an expense. Assets acquired and accounted for as capital leases are expensed as the related principal portion of the obligations under the capital leases are reduced. Accordingly, no provision has been made for depreciation of fixed assets. To maintain accountability for fixed assets, they are recorded as a balance sheet asset with a corresponding entry to either the Fund Balance "Fixed Assets" or "Obligations Under Capital Leases." As the principal portion of the "Obligations Under Capital Leases" are reduced, the related amounts are credited to the Fund Balance "Fixed Assets."

Unearned Subscription Income

Subscription revenue for published reports is taken into an unearned subscription account as received and is amortized to income as the revenue is earned. The portion which relates to future years is shown as unearned subscription income in the Statement of Financial Position.

Funding

In accordance with an agreement signed by the Provinces of Manitoba, Saskatchewan and Alberta, funding is received in the following proportions:

Manitoba	20%
Saskatchewan	45%
Alberta	35%

The Institute, in accordance with the authority included in O.C. 1800/79, follows the policy of retaining the excess of revenue over expenditure received in the year.

2. Incorporation

The Prairie Agricultural Machinery Institute was established as a body corporate under The Prairie Agricultural Machinery Institute Act, Chapter 2, 1973-74, Revised Statutes of Saskatchewan and is continued under Chapter P-21, Revised Statutes of Saskatchewan, 1978.

The purposes of the Institute include:

a) to test and appraise under actual or simulated working conditions, machinery sold or offered or intended for sale;
b) to undertake development work to improve and develop machinery for agricultural use;
c) to publish such reports, pamphlets and bulletins as are consistent with the intent of the Act.

3. Obligations Under Capital Leases

The following is a schedule of the minimum lease payments for several capital leases having implicit interest rates ranging from 13.5% to 16.6% which expire in 1988, together with the present balance of the total obligations under the capital leases:

March 31, 1985	$ 52,846
March 31, 1986	52,846
March 31, 1987	52,846
March 31, 1988	45,651
March 31, 1989	3,234
	207,423
Less: amount representing interest	54,036
	$153,387

4. Fund Balance, Fixed Assets

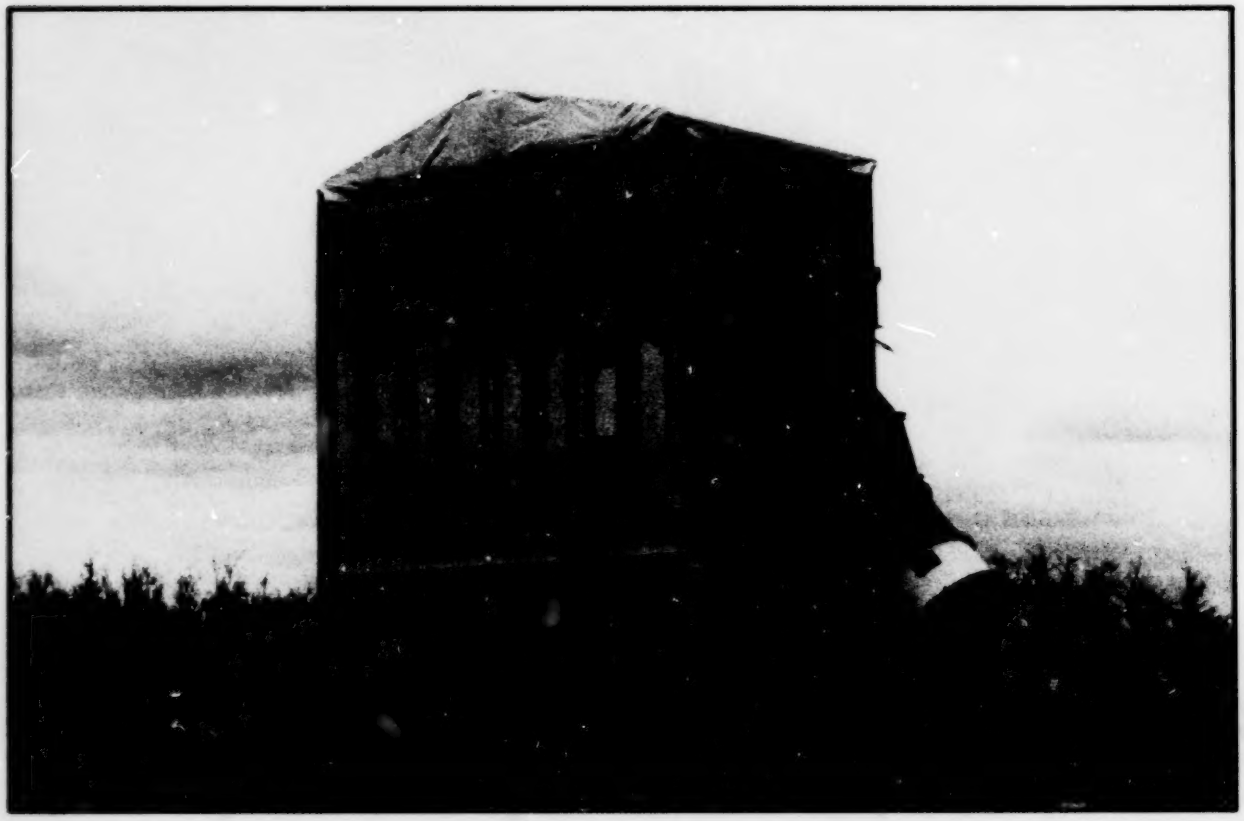
	1984	1983
Fixed assets, March 31,	$5,442,723	$5,332,411
Less obligations under capital leases	153,387	179,400
Fund balance, fixed assets	$5,289,336	$5,153,011

SCHEDULE OF EXPENDITURE

Schedule 1

Year Ended March 31, 1984
(with comparative figures for the 1933 year)

	Administration	Testing Equipment	Capital	1984 Total	1983 Total
Advertising and promotion	$ 19,140	$ 16,140	$ —	$ 35,280	$ 52,372
Bad debts	1,198	—	—	1,198	7,295
Building	—	—	10,172	10,172	85,150
Computer services	19,087	10,360	—	29,447	54,358
Contractual services	3,686	14,950	—	18,636	30,129
Employee benefits	16,975	131,092	—	148,067	132,065
Equipment — machinery to be evaluated	—	—	2,817	2,817	17,390
Equipment	—	—	131,237	131,237	235,007
Furniture and fixtures	—	—	5,452	5,452	5,393
Honoraria	7,455	—	—	7,455	11,588
Insurance, licences and taxes	200	91,527	—	91,727	77,529
Interest expense — leases	—	26,826	—	26,826	12,729
Land improvements	—	—	254	254	13,893
Printing and binding	36,475	132,524	—	168,999	130,474
Professional and technical services	9,568	—	—	9,568	6,873
Reference material	5,956	6,141	—	12,097	7,941
Rent — building and equipment	—	49,565	—	49,565	122,749
— equipment to be evaluated	—	11,658	—	11,658	138,600
Repairs and maintenance — building and equipment	642	72,447	—	73,089	59,747
Salaries	147,488	1,349,729	—	1,497,217	1,526,868
Shop supplies	—	121,293	—	121,293	115,406
Stationery and office supplies	44,212	44,468	—	88,680	89,826
Telephone and telegraph	14,482	40,548	—	55,030	60,273
Travel and vehicle operations	43,430	92,992	—	136,422	163,035
Utilities	—	58,373	—	58,373	53,997
Vehicles	—	—	41,959	41,959	—
	$369,994	$2,270,633	$191,891	$2,832,518	$3,210,687



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